AMENDMENTS TO THE CLAIMS

Please amend Claim 4.

1. (Previously presented) A method of fabricating a fixed layer for a MRAM device, the method comprising:

providing the fixed layer, the fixed layer comprising:

an antiferromagnetic pinning layer over a substrate;

a ferromagnetic pinned layer over the pinning layer, the pinned layer having a first thickness;

a spacer layer over the pinned layer;

a ferromagnetic reference layer over the spacer layer, the reference layer having a second thickness; and

annealing the fixed layer using a selected profile of temperature and magnetic field as a function of time, the profile selected based on the first thickness of the pinned layer and the second thickness of the reference layer, the profile having a maximum magnetic field magnitude (H_{anneal}).

2. (Previously presented) A method of fabricating an MRAM device, the method comprising:

fabricating the fixed layer by the method of Claim 1, the fixed layer having the reference layer; and

providing a non-magnetic tunneling layer over the fixed layer.

3. (Original) The method of Claim 2, further comprising providing a ferromagnetic free layer over the tunneling layer.

4. (Currently amended) A method of fabricating a fixed layer for a MRAM device, the method comprising:

providing the fixed layer, the fixed layer comprising:

an antiferromagnetic pinning layer over a substrate;

a ferromagnetic pinned layer over the pinning layer, the pinned layer having a first thickness;

a spacer layer over the pinned layer;

a ferromagnetic reference layer over the spacer layer, the reference layer having a second thickness; and

annealing the fixed layer using a selected profile of temperature and magnetic field as a function of time, the profile selected based on the first thickness of the pinned layer and the second thickness of the reference layer, the profile having a maximum magnetic field magnitude (H_{anneal}), wherein a first profile is selected when the first thickness is substantially equal to the second thickness, a second profile is selected when the first thickness is substantially [[**less**]] greater than the second thickness, and a third profile is selected when the first thickness is substantially [[**greater**]] less than the second thickness.

5. (Original) The method of Claim 4, wherein the first profile includes field cooling with an applied magnetic field greater than a minimum field for uniform saturation (H_{sat}) when H_{anneal} is not constrained to be less than H_{sat}.

6. (Original) The method of Claim 4, wherein the second profile includes field cooling with an applied magnetic field greater than a minimum field for uniform saturation (H_{sat}) when H_{anneal} is not constrained to be less than H_{sat}.

7. (Original) The method of Claim 4, wherein the second profile includes soaking with H_{anneal} and field cooling with an applied magnetic field greater than a maximum field for trapping vortices or reversed magnetization (H_{rm}) and less than a low field uniform magnetization boundary (H_{uL}) when H_{anneal} is constrained to be less than H_{sat}.

8. (Original) The method of Claim 4, wherein the second profile includes field cooling with an applied magnetic field greater than a maximum field for trapping vortices or reversed magnetization (H_{rm}) when H_{anneal} is constrained to be less than a low field uniform magnetization boundary (H_{uL}).

9. (Original) The method of Claim 4, wherein the third profile includes field cooling with an applied magnetic field greater than a minimum field for uniform saturation (H_{sat}) when the H_{anneal} is not constrained to be less than H_{sat}.

10. (Original) The method of Claim 4, wherein the third profile includes soaking with H_{anneal} and cooling without an applied magnetic field when H_{anneal} is constrained to be less than a minimum field for uniform saturation (H_{sat}).

11. (Original) The method of Claim 4, wherein the third profile includes soaking with H_{anneal} and field cooling with an applied magnetic field equal to the negative of a maximum field for trapping vortices or reversed magnetization ($-H_{rm}$) when H_{anneal} is constrained to be less than a minimum field for uniform saturation (H_{sat}).

12. (Original) The method of Claim 4, wherein the third profile includes soaking with H_{anneal} and cooling without an applied magnetic field when H_{anneal} is constrained to be less than a low field uniform magnetization boundary (H_{uL}).

13. (Original) The method of Claim 4, wherein the third profile includes soaking with H_{anneal} and field cooling with an applied magnetic field equal to the negative of a maximum field for trapping vortices or reversed magnetization ($-H_{rm}$) when H_{anneal} is constrained to be less than a low field uniform magnetization boundary (H_{uL}).

14. (Canceled)

15. (Previously presented) A method of fabricating a MRAM device, the method comprising:

providing a fixed layer comprising:

an antiferromagnetic pinning layer over a substrate;

a ferromagnetic pinned layer over the pinning layer, the pinned layer having a first thickness;

a spacer layer over the pinned layer;

a ferromagnetic reference layer over the spacer layer, the reference layer having a second thickness; and

annealing the fixed layer using a selected profile of temperature and magnetic field as a function of time, the profile selected based on the first thickness of the pinned layer and the second thickness of the reference layer.

16. (Previously presented) A method of fabricating a MRAM device, the method comprising:

providing a synthetic antiferromagnetic layer having a ferromagnetic pinned layer having a first thickness and a ferromagnetic reference layer having a second thickness; and

annealing the synthetic antiferromagnetic layer using a selected profile of temperature and magnetic field as a function of time, the profile selected based on the first thickness and the second thickness.